**TRANSMITTAL OF FORMAL DRAWINGS**Docket No.
907B.0004.USURe Application Of: **HALL et al**

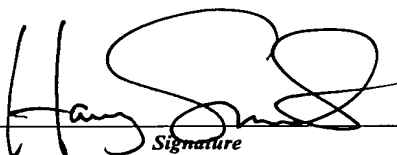
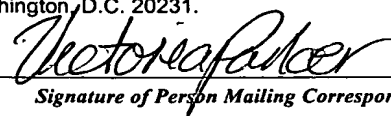
| Serial No. | Filing Date | Batch No. | Examiner | Art Unit |
|------------|----------------|-----------|----------|----------|
| 09/833,720 | April 12, 2001 | Unknown | Unknown | 2661 |

Invention: **Hybrid Synchronous Space/Code Multiple Access System using An Adaptive Antenna System**Address to:
Assistant Commissioner for Patents
Washington, D.C. 20231

Transmitted herewith are:

6 sheets of formal drawing(s) for this application.

Each sheet of drawing indicates the identifying indicia suggested in 37 CFR Section 1.84(c) on the reverse side of the drawing.


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(203) 366-4109Dated: **November 27, 2001**I certify that this document and attached formal drawings are being deposited on **November 27, 2001** with the U.S. Postal Service as first class mail under 37 C.F.R. 1.8 and addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.
Signature of Person Mailing Correspondence**Victoria Parker**

Typed or Printed Name of Person Mailing Correspondence

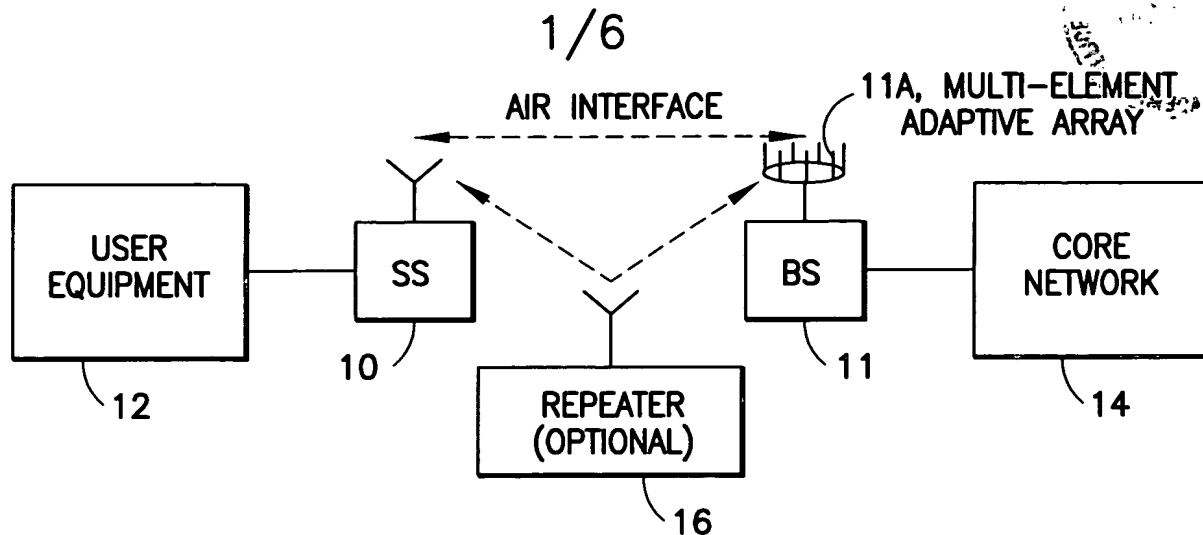


FIG. 1 WIRELESS ACCESS REFERENCE MODEL

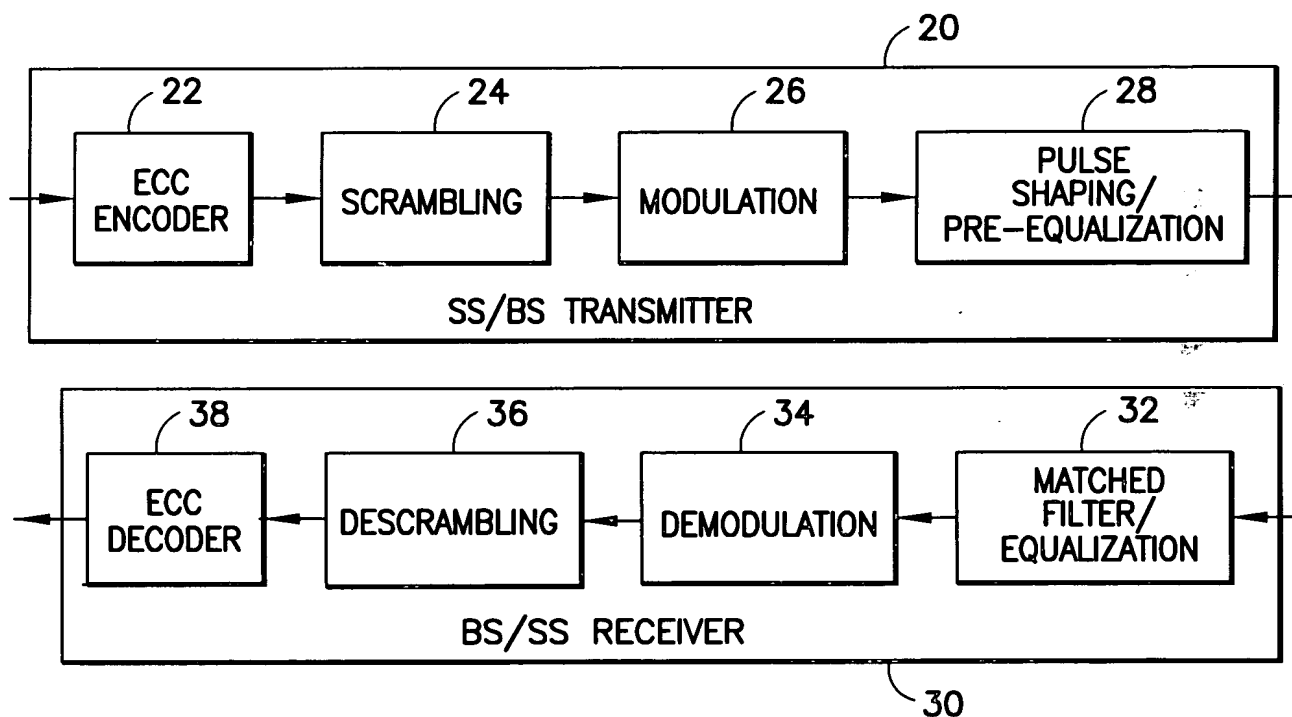


FIG. 2 PHY REFERENCE MODEL SHOWING DATA FLOW

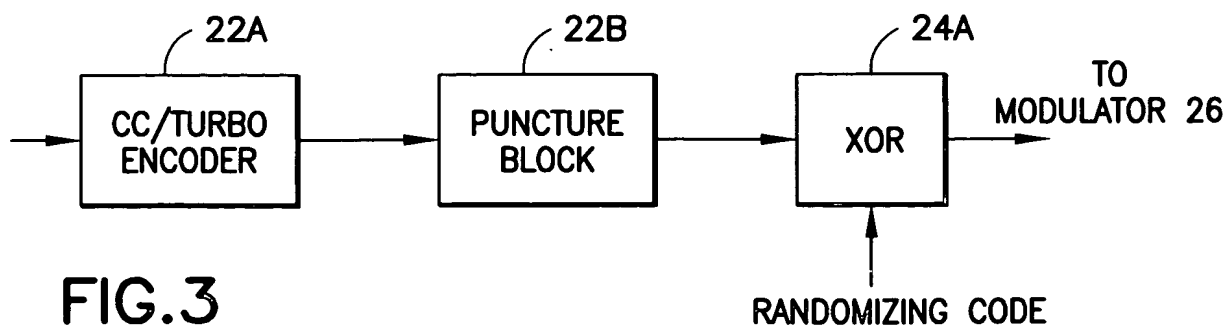
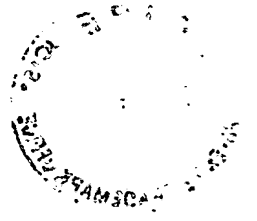


FIG. 3

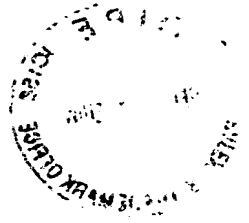


| PARAMETER | MODULATION AND CHANNEL CODING | | |
|---------------------------------|--|--|--|
| | QPSK w/R=4/5 CODING (1.6 BITS/SYM) | 16-QAM w/R=4/5 CODING (3.2 BITS/SYM) | 64-QAM w/R=4/5 CODING (4.8 BITS/SYM) |
| RF CHANNEL BANDWIDTH | 3.5 MHz | 3.5 MHz | 3.5 MHz |
| CHIP RATE | 2.56 Mcps | 2.56 Mcps | 2.56 Mcps |
| COMMUNICATION CHANNEL BANDWIDTH | 4.096 Mbps | 8.192 Mbps | 12.288 Mbps |
| PEAK DATA RATE | 4.096 Mbps | 8.192 Mbps | 12.288 Mbps |
| CDMA CHANNEL BANDWIDTH (SF=1) | 4.096 Mbps | 8.192 Mbps | 12.288 Mbps |
| CDMA CHANNEL BANDWIDTH (SF=16) | 256 kbps | 512 kbps | 768 kbps |
| CDMA CHANNEL BANDWIDTH (SF=128) | 32 kbps | 64 kbps | 96 kbps |
| MODULATION FACTOR | 1.17 bps/Hz | 2.34 bps/Hz | 3.511 bps/Hz |

FIG.4 HYPOTHETICAL PARAMETERS FOR A 3.5 MHz RF CHANNELIZATION

| NUMBER OF ELEMENTS | QPSK | | 16 QAM | | 64 QAM | |
|--------------------|---------------------------|-------------------|---------------------------|-------------------|---------------------------|-------------------|
| | AGGREGATE CAPACITY (Mbps) | MODULATION FACTOR | AGGREGATE CAPACITY (Mbps) | MODULATION FACTOR | AGGREGATE CAPACITY (Mbps) | MODULATION FACTOR |
| 1 | 4.096 | 1.17 | 8.192 | 2.34 | 12.288 | 3.511 |
| 2 | 8.192 | 2.34 | 16.384 | 4.68 | 24.576 | 7.022 |
| 4 | 16.384 | 4.68 | 32.768 | 9.36 | 49.152 | 14.044 |
| 8 | 32.768 | 9.36 | 65.536 | 18.72 | 98.304 | 28.088 |
| 16 | 65.536 | 18.72 | 131.072 | 37.44 | 196.608 | 56.176 |

FIG.5 AGGREGATE CAPACITY AND MODULATION FACTORS VERSUS MODULATION TYPE AND ARRAY SIZE



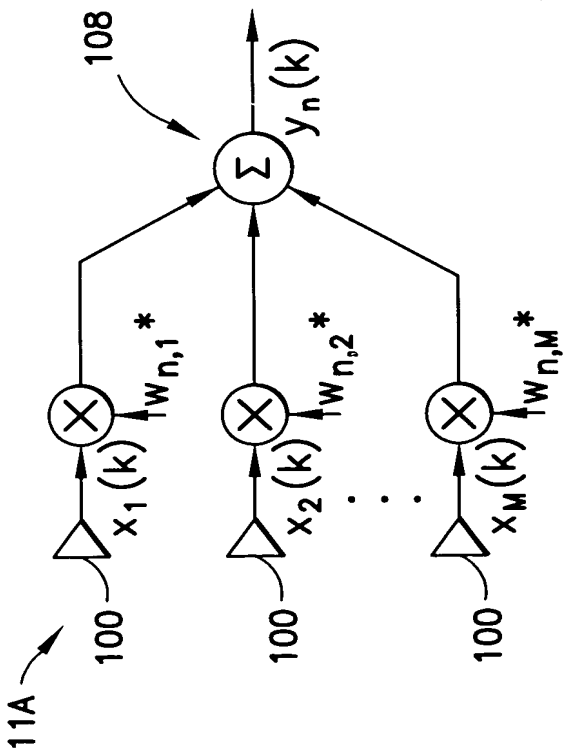
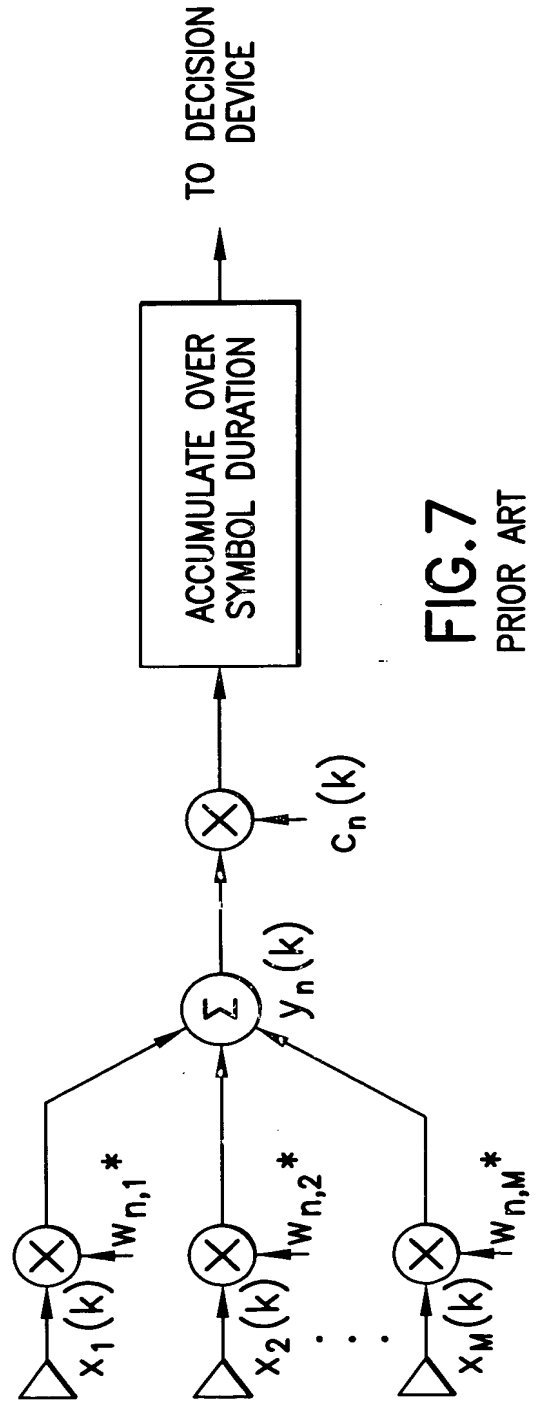


FIG. 6A

$$y_n(t) = [w_{n,1}^* \ w_{n,2}^* \ \dots \ w_{n,m}^*] \begin{bmatrix} x_1(t) \\ x_2(t) \\ \vdots \\ x_m(t) \end{bmatrix}$$

FIG. 6B

FIG. 7
PRIOR ART

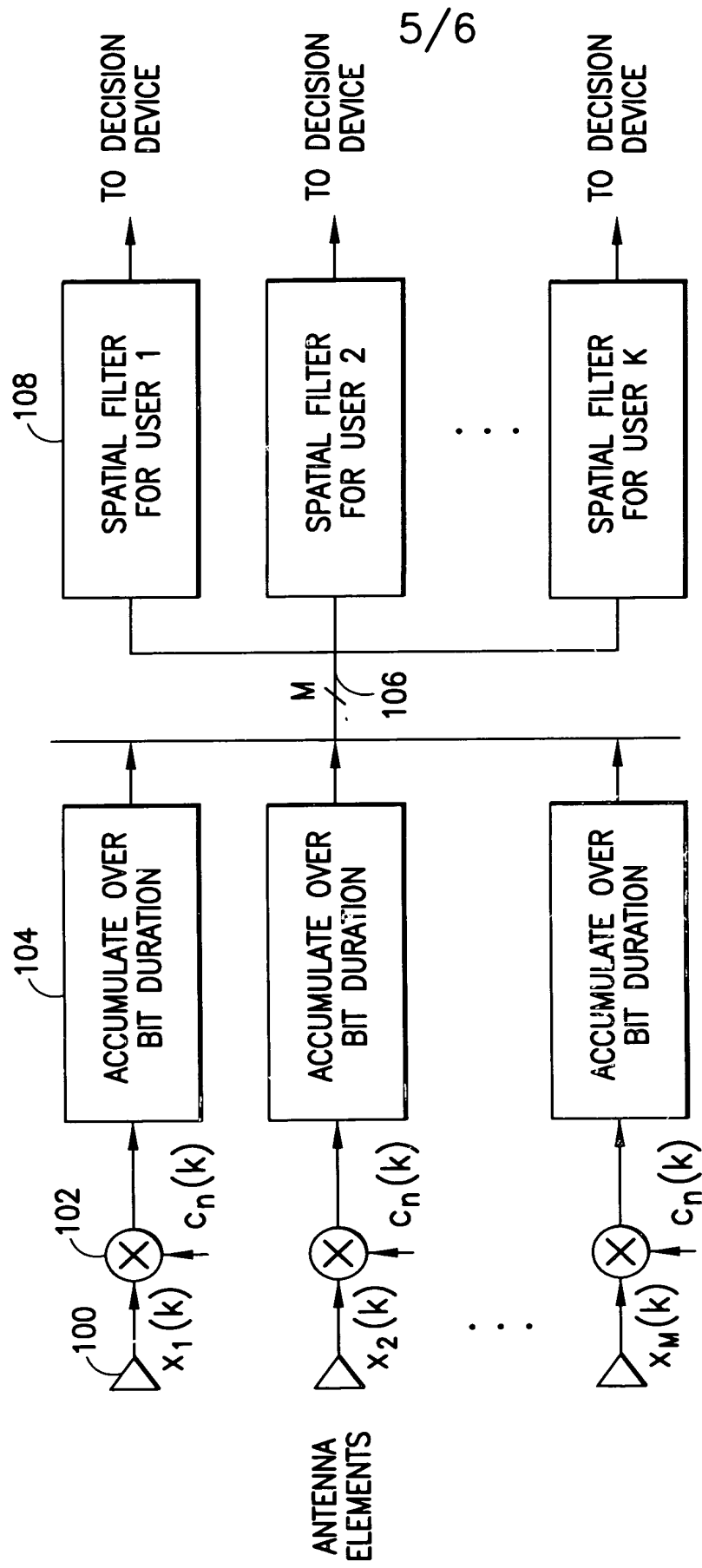


FIG.8



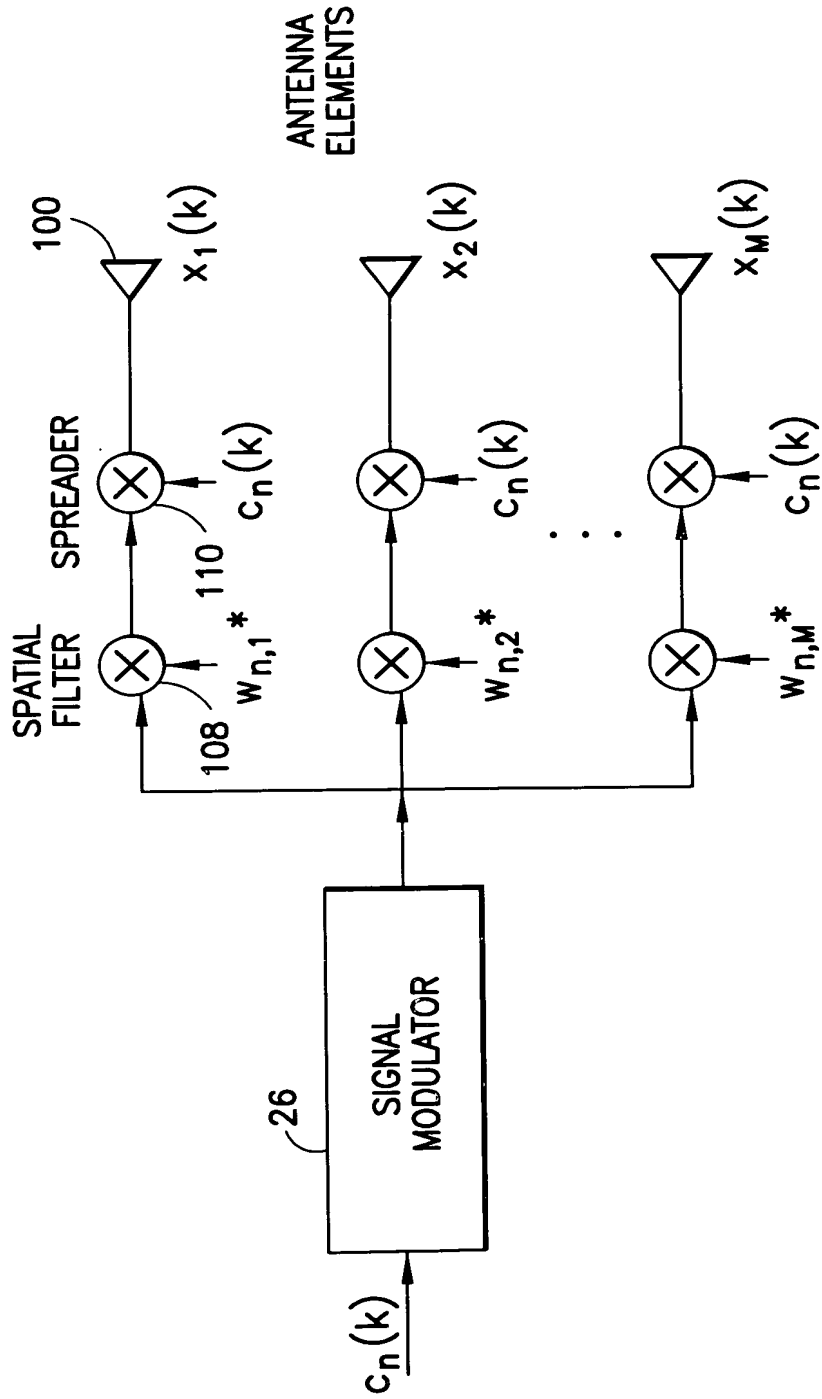


FIG. 9

$$\mathbf{v} = \begin{bmatrix} \alpha_1 \exp(j\phi_1) \\ \alpha_2 \exp(j\phi_2) \\ \vdots \\ \alpha_M \exp(j\phi_M) \end{bmatrix}$$

FIG. 10